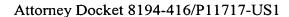# SYSTEMS AND METHODS FOR COMMUNICATING SPREAD SPECTRUM SIGNALS USING VARIABLE SIGNAL CONSTELLATIONS

ABSTRACT OF THE DISCLOSURE

According to embodiments of the invention, a communications system includes an error correction encoder that error correction encodes a bitstream according to an error correction code. The system also includes a variable symbol generator that generates a symbol according to a selected one of a plurality of

5   selectable signal constellations from a group of bits of the error correction encoded bitstream. The system further includes a spreader that spreads the symbol according to a spreading code, and a transmitter that transmits the spread symbol in a communications medium. Preferably, the plurality of selectable signal constellations includes at least two signal constellations of different order. In other embodiments,

10   the error correction encoder includes a variable error correction encoder that encodes the bitstream according to a selected error correction code of a plurality of selectable error correction codes. In still other embodiments, the spreader includes a variable spreader that spreads the symbol according to a selected spreading code of a plurality of selectable orthogonal spreading codes including at least two spreading codes of

15   different lengths. A controller may select the error correction code used by the variable error correction encoder, the signal constellation used by the variable symbol generator, and the spreading code used by the variable spreader to provide a desired information transmission rate for the bitstream. Related methods are also described.